# CONTENTS

VOLUME 103 · NUMBER 1 · JANUARY 1994

1 THOMAS A. HEMING, JULIO COPELLO, and LUIS REUSS. Regulation of cAMP-activated apical membrane chloride conductance in gallbladder epithelium

19 DOROTHY A. HANCK, JONATHAN C. MAKIELSKI, and MICHAEL F. SHEETS. Kinetic effects of quarternary lidocaine block of cardiac sodium channels: a gating current study

45 LONNIE P. WOLLMUTH. Mechanism of $Ba^{2+}$ block of M-like K channels of rod photoreceptors of tiger salamanders

67 VINCENT J. COCCIA and RICK H. COTE. Regulation of intracellular cyclic GMP concentration by light and calcium in electropermeabilized rod photoreceptors

87 JOSEPH W. LYNCH and BERND LINDEMANN. Cyclic nucleotide-gated channels of rat olfactory receptor cells: divalent cations control the sensitivity to cAMP

107 JESÚS GARCÍA and KURT G. BEAM. Measurement of calcium transients and slow calcium current in myotubes

125 JESÚS GARCÍA, TSUTOMU TANABE, and KURT G. BEAM. Relationship of calcium transients to calcium currents and charge movements in myotubes expressing skeletal and cardiac dihydropyridine receptors

VOLUME 103 · NUMBER 2 · FEBRUARY 1994

153 MICHAEL J. ACKERMAN, KEVIN D. WICKMAN, and DAVID E. CLAPHAM. Hypotonicity activates a native chloride current in *Xenopus* oocytes

181 ADRIENNE E. DUBIN and VINCENT E. DIONNE. Action potentials and chemosensitive conductances in the dendrites of olfactory neurons suggest new features for odor transduction

203 A. N. LOPATIN and C. G. NICHOLS. Internal $Na^+$ and $Mg^{2+}$ blockade of DRK1 (Kv2.1) potassium channels expressed in *Xenopus* oocytes. Inward rectification of a delayed rectifier

217 GOPAL C. KOWDLEY, STEPHEN J. ACKERMAN, J. EDWARD JOHN, III, LARRY R. JONES, and J. RANDALL MOORMAN. Hyperpolarization-activated chloride currents in *Xenopus* oocytes

231 MASOUD M. ZAREI and JOHN A. DANI. Ionic permeability characteristics of the *N*-methyl-D-aspartate receptor channel

249 TOSHINORI HOSHI, WILLIAM N. ZAGOTTA, and RICHARD W. ALDRICH. *Shaker* potassium channel gating I: transitions near the open state

279 WILLIAM N. ZAGOTTA, TOSHINORI HOSHI, JEREMY DITTMAN, and RICHARD W. ALDRICH. *Shaker* potassium channel gating II: transitions in the activation pathway

321 WILLIAM N. ZAGOTTA, TOSHINORI HOSHI, and RICHARD W. ALDRICH. *Shaker* potassium channel gating III: evaluation of kinetic models for activation

VOLUME 103 · NUMBER 3 · MARCH 1994

365 RICARDO E. DOLMETSCH and RICHARD S. LEWIS. Signaling between intracellular $Ca^{2+}$ stores and depletion-activated $Ca^{2+}$ channels generates $[Ca^{2+}]_i$ oscillations in T lymphocytes

389 ROGER C. HARDIE and BARUCH MINKE. Spontaneous activation of light-sensitive channels in *Drosophila* photoreceptors

409 ROGER C. HARDIE and BARUCH MINKE. Calcium-dependent inactivation of light-sensitive channels in *Drosophila* photoreceptors

429 HIROSHI TATSUTA, SHUNJI UEDA, SHIGERU MORISHIMA, and YASUNOBU OKADA. Voltage- and time-dependent $K^+$ channel currents in the basolateral membrane of villus enterocytes isolated from guinea pig small intestine

447 ROBERT J. FRENCH, JENNINGS F. WORLEY, III, WILLIAM F. WONDERLIN, A. SHAVANTHA KULARATNA, and BRUCE K. KRUEGER. Ion permeation, divalent ion block, and chemical modification of single sodium channels. Description by single- and double-occupancy rate-theory models

471 STEVEN PETROU, RICHARD W. ORDWAY, JAMES A. HAMILTON, JOHN V. WALSH, JR., and JOSHUA J. SINGER. Structural requirements for charged lipid molecules to directly increase or suppress $K^+$ channel activity in smooth muscle cells. Effects of fatty acids, lysophosphatidate, acyl coenzyme A and sphingosine

487 CHRISTOPHER A. MCCORMACK and MARY T. MCDONNELL. Circadian regulation of teleost retinal cone movements in vitro

501 GING KUO WANG and SHO-YA WANG. Binding of benzocaine in batrachotoxin-modified $Na^+$ channels. State-dependent interactions

VOLUME 103 · NUMBER 4 · APRIL 1994

519 MICHAEL R. SILVER, MARK S. SHAPIRO, and THOMAS E. DECOURSEY. Effects of external $Rb^+$ on inward rectifier $K^+$ channels of bovine pulmonary artery endothelial cells

549 PETER S. PENNEFATHER and THOMAS E. DECOURSEY. A scheme to account for the effects of $Rb^+$ and $K^+$ on inward rectifier K channels of bovine artery endothelial cells

583 VALERIE URBACH, EMMY VAN KERKHOVE, and BRIAN J. HARVEY. Inward-rectifier potassium channels in basolateral membranes of frog skin epithelium

605 FRÉDÉRIC JAISSER, PHILIPPE JAUNIN, KÄTHI GEERING, BERNARD C. ROSSIER, and JEAN-DANIEL HORISBERGER. Modulation of the Na,K-pump function by β subunit isoforms

625 TSUKASA TAMEYASU, HIROYOSHI KASUGAI, MIDORI TANAKA, and HIME HARADA. Sarcomere dynamics in a spontaneous contraction wave and its effect on the following, electrically triggered twitch in rat myocyte. Comparison with the rested state twitch

647 UDO KLÖCKNER and GERRIT ISENBERG. Intracellular pH modulates the availability of vascular L-type $Ca^{2+}$ channels

665 UDO KLÖCKNER and GERRIT ISENBERG. Calcium channel current of vascular smooth muscle cells: extracellular protons modulate gating and single channel conductance

679 ALFREDO KIRKWOOD and JOHN E. LISMAN. Determinants of single photon response variability

691 MARC A. GOLDRING and JOHN E. LISMAN. Multi-step rhodopsin inactivation schemes can account for the size variability of single photon responses in *Limulus* ventral photoreceptors

VOLUME 103 · NUMBER 5 · MAY 1994

731 ERIC A. ERTEL, MCHARDY M. SMITH, MARK D. LIEBOWITZ, and CHARLES J. COHEN. Isolation of myocardial L-type calcium channel gating currents with the spider toxin ω-Aga-IIIA

755 THOMAS E. DECOURSEY and VLADIMIR V. CHERNY. $Na^+/H^+$ antiport detected through hydrogen ion currents in rat alveolar epithelial cells and human neutrophils

787 BERND NILIUS, MASAHIRO OIKE, IVAN ZAHRADNIK, and GUY DROOGMANS. Activation of a $Cl^-$ current by hypotonic volume increase in human endothelial cells

807 NITZA ILAN, AMNON SCHWARTZ, and NAVA MORAN. External pH effects on the depolarization-activated K channels in guard cell protoplasts of *Vicia faba*

833 S. NAKAYAMA, H. NOMURA, and T. TOMITA. Intracellular-free magnesium in the smooth muscle of guinea pig taenia caeci: a concomitant analysis for magnesium and pH upon sodium removal

853 QIANG TU, PATRICIO VELEZ, MARCIA CORTES-GUTIERREZ, and MICHAEL FILL. Surface charge potentiates conduction through the cardiac ryanodine receptor channel

869 ANJALI SAGAR and R. F. RAKOWSKI. Access channel model for the voltage dependence of the forward-running $Na^+/K^+$ pump

895 MARC A. POST and DAVID C. DAWSON. Basolateral $Na^+$-$H^+$ antiporter. Mechanisms of electroneutral and conductive ion transport

917 BRUNS A. WATTS, III and DAVID W. GOOD. Effects of amonium on intracellular pH in rat medullary thick ascending limb: mechanisms of apical membrane $NH_4^+$ transport

VOLUME 103 · NUMBER 6 · JUNE 1994

939 MARIA DEL PILAR GOMEZ and ENRICO NASI. The light-sensitive conductance of hyperpolarizing invertebrate photoreceptors: a patch-clamp study

957 MAKOTO KASHIWAYANAGI, HAJIME KAWAHARA, TAKUYA HANADA, and KENZO KURIHARA. A large contribution of a cyclic AMP-independent pathway to turtle olfactory transduction

975 WOLFGANG SHREINER, MARTIN NEUMANN, FRIEDERIKE NEUMANN, SUSANNE M. ROEDLER, ADELHEID END, P. BUXBAUM, MICHAEL R. MÜLLER, and PAUL SPIEKERMANN. The branching angles in computer-generated optimized models of arterial trees

991 SUSAN L. STONE. White noise analysis of a chromatic type horizontal cell in the *Xenopus* retina

1019 WALLACE B. THORESON and ROBERT F. MILLER. Actions of (1S,3R)-1-aminocyclopentane-1,3-dicarboxylic acid (1S,3R-ACPD) in retinal ON bipolar cells indicate that it is an agonist at L-AP4 receptors

1035 PETER M. CALA and HECTOR M. MALDONADO. pH regulatory Na/H exchange by *Amphiuma* red blood cells

1055 A. M. HURST, J.-Y. LAPOINTE, A. LAAMARTI, and P. D. BELL. Basic properties and potential regulators of the apical $K^+$ channel in macula densa cells

1071 CHARLES L. DUMKE, VADIM Y. ARSHAVSKY, PETER D. CALVERT, M. DERIC BOWNDS, and EDWARD N. PUGH, JR. Rod outer segment structure influences the apparent kinetic parameters of cyclic GMP phosphodiesterase

1099 AUTHOR INDEX TO VOLUME 103